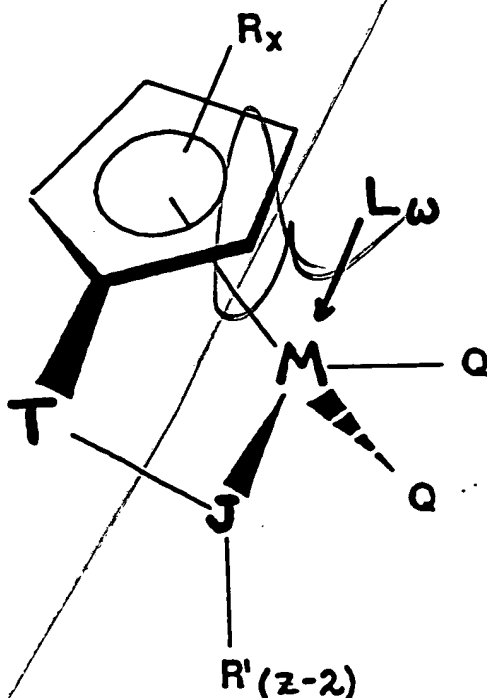


CLAIMS:

1. A process for producing crystalline poly- α -olefins comprising the steps of
 - (i) contacting an α -olefin monomer at a temperature and pressure sufficient to polymerize such monomer with a catalyst system comprising;
 - (A) an alumoxane, and
 - (B) a group IV-B transition metal component of the formula



wherein M is Zr , Hf or Ti in its highest formal oxidation state;

R is a substituent group with "x" denoting the degree of substitution ($x = 0, 1, 2, 3$ or 4) and each R is, independently, a radical selected from a group consisting of C_1 - C_{20} hydrocarbyl radicals, substituted C_1 - C_{20} hydrocarbyl radicals wherein one or more hydrogen atoms is replaced by a halogen radical, an amido radical,

17 a phosphido radical, an alkoxy radical or any other
18 radical containing a Lewis acidic or basic functionality,
19 C_1-C_{20} hydrocarbyl-substituted metalloids wherein
20 the metalloid is selected from the Group IV A of the
21 Periodic Table of Elements, and halogen radicals, amido
22 radicals, phosphido radicals, alkoxy radicals,
23 alkylborido radicals or a radical containing Lewis acidic
24 or basic functionality, or at least two adjacent R-groups
25 are joined forming C_4-C_{20} ring to give a saturated or
26 unsaturated polycyclic cyclopentadienyl ligand.

27 (JR'_{z-2}) is a heteroatom ligand in which J is an
28 element with a coordination number of three from Group V
29 A or an element with a coordination number of two from
30 Group VI A of the Periodic Table of Elements, and each R'
31 is, independently a radical selected from a group
32 consisting of C_1-C_{20} hydrocarbyl radicals, substituted
33 C_1-C_{20} hydrocarbyl radicals where one or more hydrogen
34 atom is replaced by a halogen radical, an amido radical,
35 a phosphido radical, and alkoxy radical or a radical
36 containing a Lewis acidic or basic functionality, and "z"
37 is the coordination number of the element J;

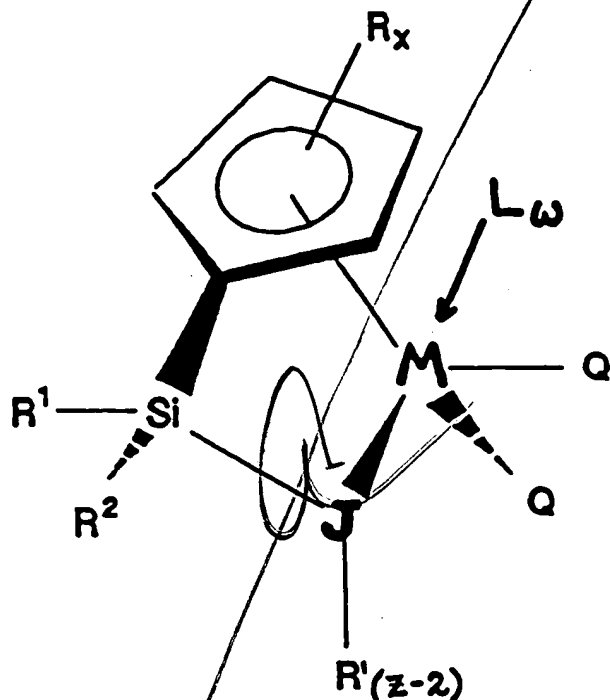
38 each Q is, independently, any univalent anionic
39 ligand, such as a halide, hydride, or a substituted or
40 unsubstituted C_1-C_{20} hydrocarbyl, alkoxide, aryloxide,
41 amide, arylamide, phosphide or arylphosphide, or both Q
42 together are an alkylidene, or a cyclometallated
43 hydrocarbyl or any divalent anionic chelating ligand;

44 T is a covalent bridging group containing a
45 Group IV A or V A element;

46 L is a neutral Lewis base where "w" denotes a
47 number from 0 to 3;

48 (ii) recovering a crystalline poly- α -
49 olefin.

2. The process of claim 1, wherein the Group IV-B transition metal component is of the formula:

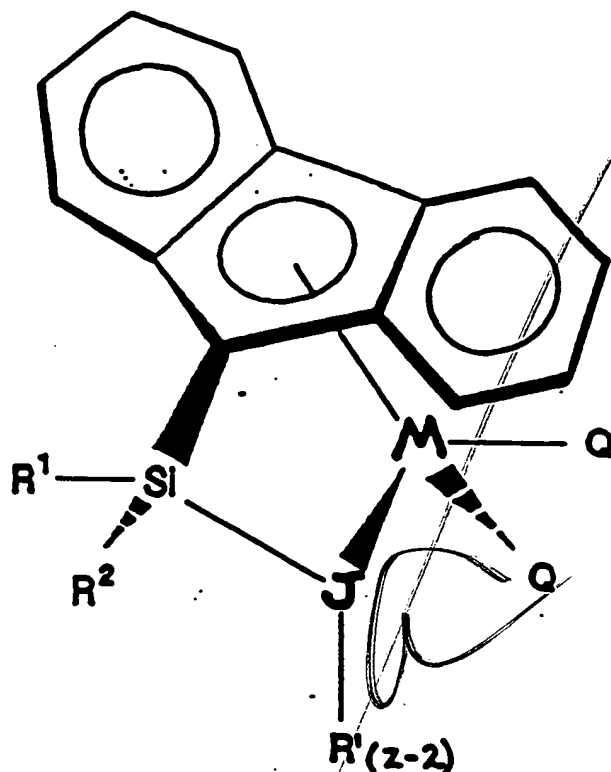


wherein R^1 and R^2 are, independently, a C_1 to C_{20} hydrocarbyl radicals, substituted C_1 to C_{20} hydrocarbyl radicals wherein one or more hydrogen atom is replaced by a halogen atom; R^1 and R^2 may also be joined forming a C_3 to C_{20} ring.

3. The processes of claims 1 or 2 wherein J is nitrogen.

4. The process of claim 3 wherein R is a C_1 to C_{20} hydrocarbyl radical, "x" is 1 and R' is a C_6 to C_{20} cyclohydrocarbyl radical or an aromatic radical.

5. The process of claim 1 wherein the Group IV-B transition metal component is of the formula:

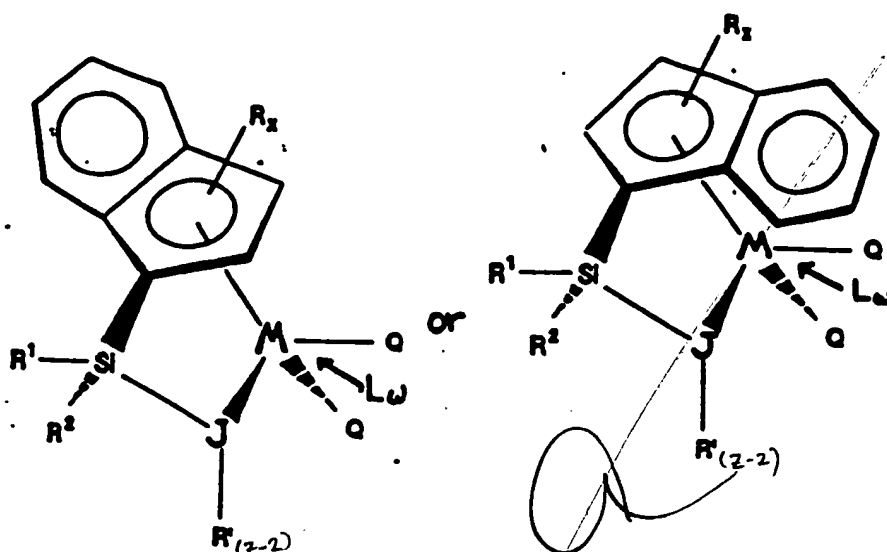


wherein R^1 and R^2 are independently a C_1 to C_{20} hydrocarbyl radicals, substituted C_1 to C_{20} hydrocarbyl radicals wherein one or more hydrogen atom is replaced by a halogen atom; R^1 and R^2 may also be joined forming a C_3 to C_{20} ring.

6. The process of claim 5 where J is nitrogen.

7. The process of claim 6 wherein R' is an alkyl radical or cyclic radical.

8. The process of claim 1 wherein the Group IV-B transition metal component is of the formula



3 wherein R¹ and R² are independently a C₁ to C₂₀
 4 hydrocarbyl radicals, substituted C₁ to C₂₀ hydrocarbyl
 5 radicals wherein one or more hydrogen atom is replaced by
 6 a halogen atom; R¹ and R² may also be joined forming a C₃
 7 to C₂₀ ring.

1 9. The process of claim 8 wherein J is nitrogen.

1 10. The process of claim 9 wherein R' is a
 2 cycloalkyl radical.

1 11. The process of claim 2, 5, or 8 wherein M is
 2 titanium.

1 12. The process of claims 2 or 5 wherein M is
 2 hafnium or zirconium.

1 13. The process of claim 1 wherein T is silicon, J
 2 is nitrogen and when R is an alkyl radical, R' is a
 3 cyclohydrocarbyl or aromatic radical, and when "x" is 2
 4 or 4 and the R substituents form a polycyclic ring
 5 system, R' is an alkyl or cyclohydrocarbyl radical.

add
B 3